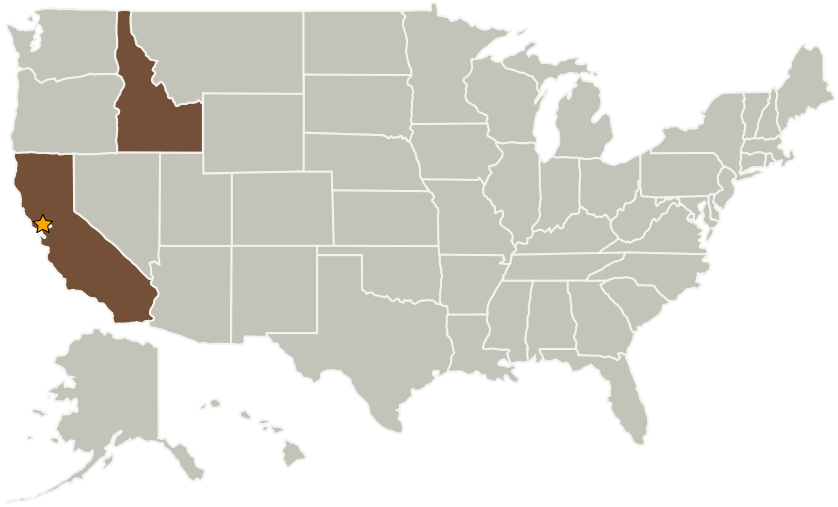
Model Updating in Online Aircraft Prognosis Systems, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Diagnostic and prognostic algorithms for many aircraft subsystems are steadily maturing. Unfortunately there is little experience integrating these technologies into a complete and practical on-board prognosis system, and integration often proceeds in an ad-hoc manner. Sentient Corporation proposes to develop a general-purpose architecture and set of reusable algorithms for integrating diagnostics and predictive models into an efficient and highly accurate prognostic system. The architecture is based on a flexible and powerful model updating algorithm that provides optimal fusion of diagnostics with model-based state indications and minimization of uncertainty in remaining life predictions. This project will focus on development of several key features of that algorithm, including automatic recognition of a failure that is not progressing according to the physical model, and practical considerations for on-board use such as minimizing computational and memory requirements. By the end of Phase II, Sentient will demonstrate a working prototype of an on-board prognostic system developed using the proposed architecture and tools. This demonstration will use diagnostic and model algorithms developed under the DARPA Prognosis Program, and will be compared to a large set of fault data for turbine engine and subscale bearings.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Sentient Corporation	Supporting Organization	Industry	Idaho Falls, Idaho

Primary U.S. Work Locations	
California	Idaho

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts